

### ■ 3 Comparison of Lens types

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Needs["Optica`Optica`"]

doublet = DataToOptica[LensDoublet, FocalLength -> 100, ComponentBoundary -> 50]

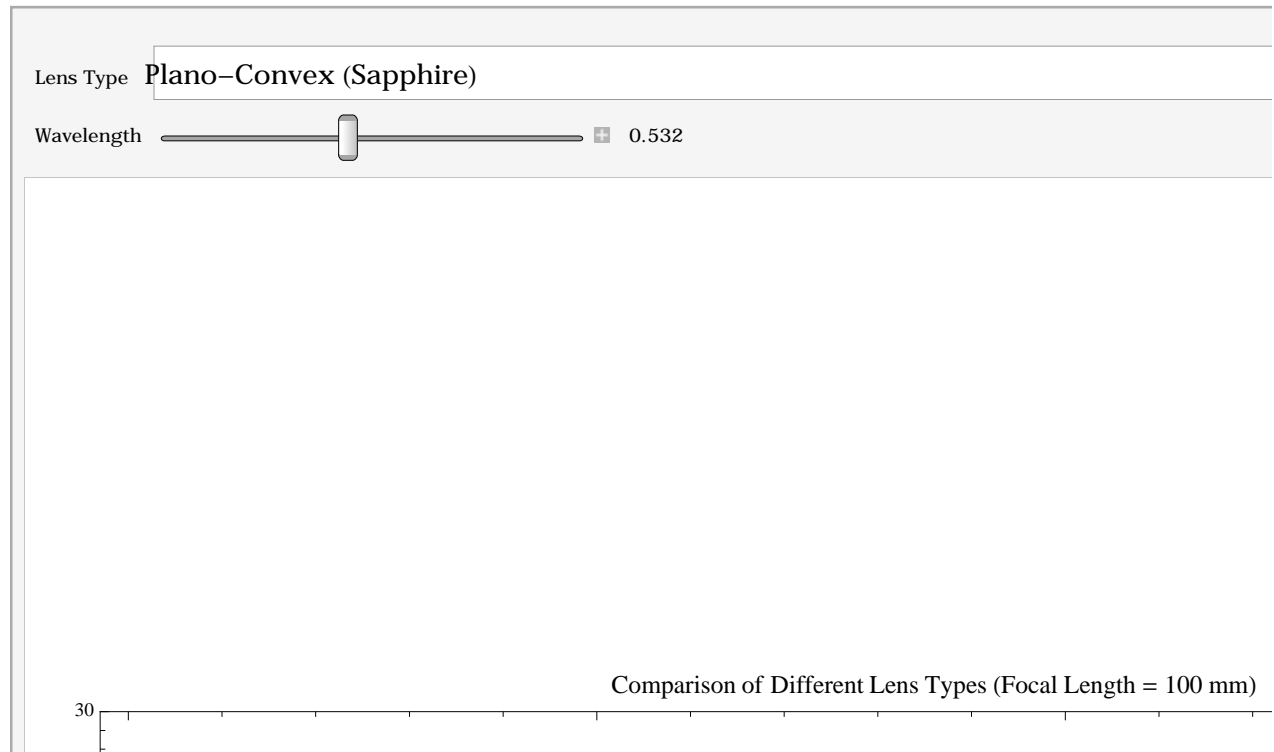
LensDoublet[58.39, -40.83, -164.44, 50., 16.5, 2., BK7, F4]

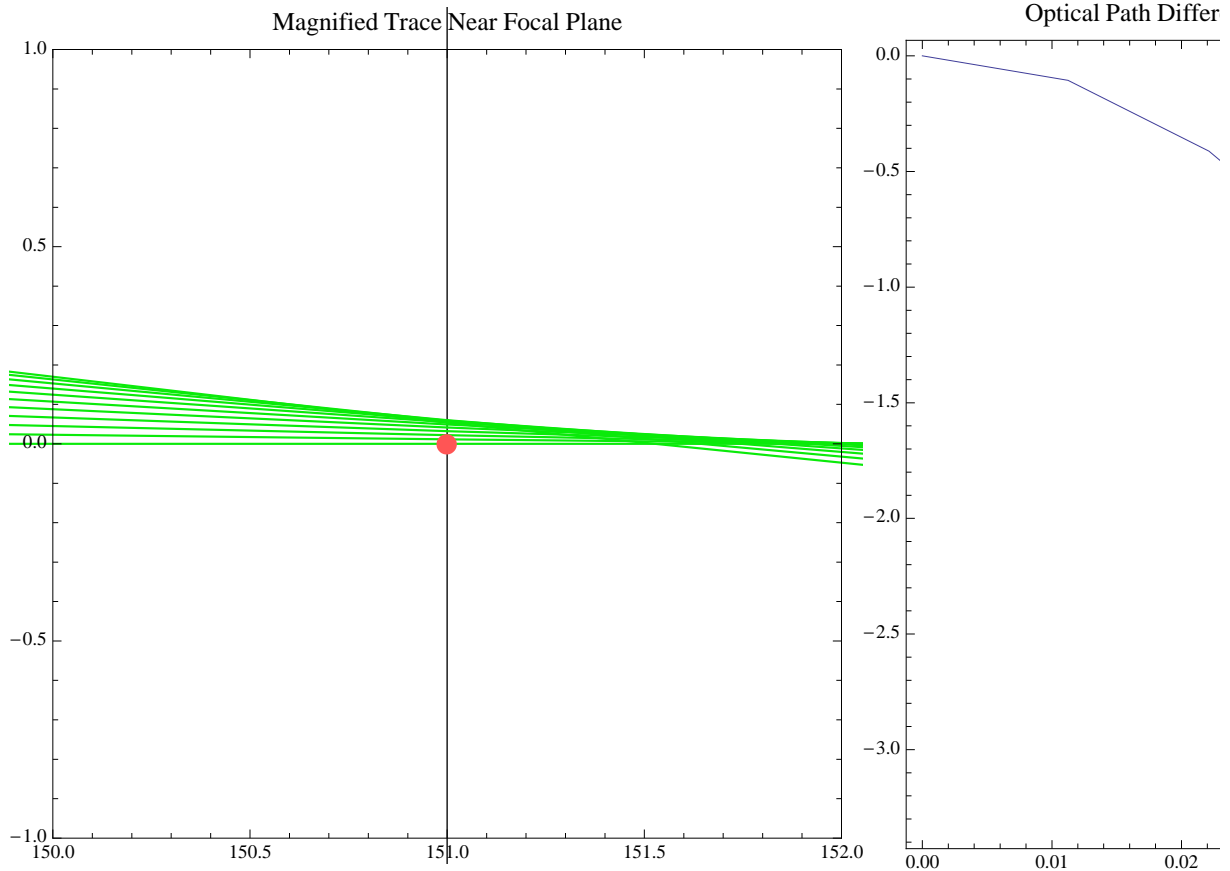
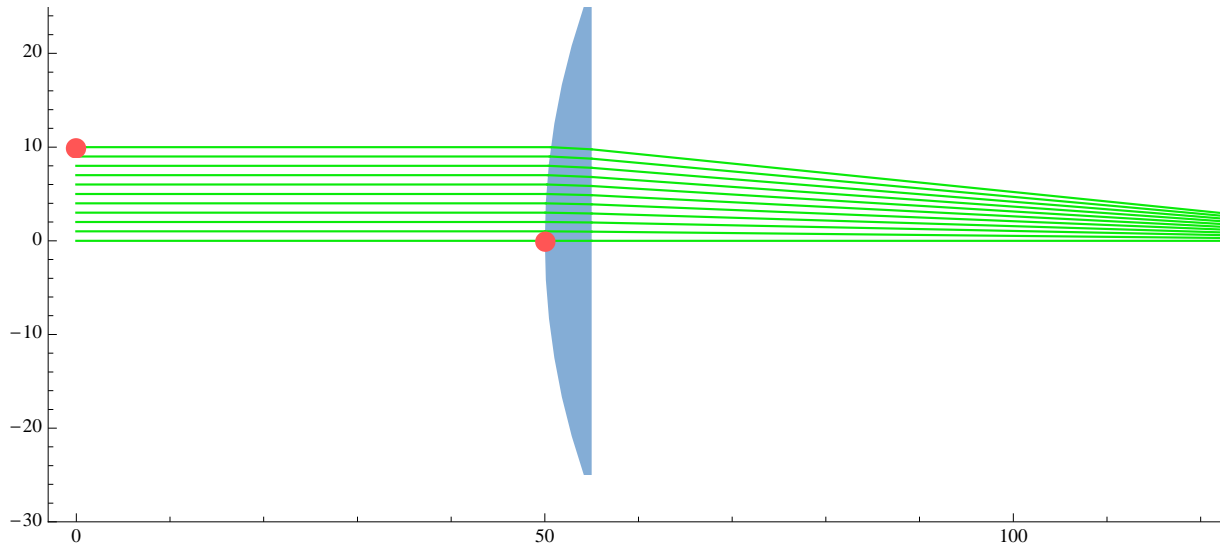
ManipulateSystem[
  {Table[Move[SingleRay[NumberOfRays -> 11, Wavelength -> lam], {0, {ys * f, 0}}, {f, 0, 1, .1}],
    Move[PlanoConvexLens[100, 50, 10], {{x1, 50}, {y - 1, -1}}],

    Move[PlanoConvexLens[100, 50, 10, CurvatureDirection -> Back], {{x2, 50}, {y - 100, -100}}],
    Move[SphericalLens[57.36078492440375, -385.36854412733703, 50, 10],
    {{x3, 50}, {y - 200, -200}}],
    Move[BiConvexLens[100, 50, 10], {{x4, 50}, {y - 300, -300}}],
    Move[doublet, {{x5, 41.9}, {y - 400, -400}}],

    Move[PlanoConvexLens[100, 50, 5, ComponentMedium -> Sapphire], {{x7, 50}, {y - 500, -500}}],
    Move[Screen[30], {x, 151}], Boundary[175, 75, GraphicDesign -> False]],
  {{lam, .532}, .4, .7},
  {{y, 1, "Lens Type"}, {1 -> "Plano-Convex (BK7)", 100 -> "Reversed Plano-Convex (BK7)",
    200 -> "\"Best Form\" Shape (BK7)", 300 -> "Bi-Convex (BK7)", 400 -> "Lens Doublet (BK7,F4)",
    500 -> "Plano-Convex (Sapphire)"}}, Column[{{DynamicFrame[PlotType -> TopView,
    PlotLabel -> "Comparison of Different Lens Types (Focal Length = 100 mm)",
    PlotRange -> {{-3, 175}, {-30, 30}}, Frame -> True],
    Row[{{DynamicFrame[PlotType -> TopView, PlotLabel -> "Magnified Trace Near Focal Plane",
    PlotRange -> Dynamic[{{x - 1, x + 1}, {-1, 1}}], Frame -> True, ImageSize -> 400],
    DynamicFrame[PlotType -> OpticalPathDifference, PlotRange -> All,
    PlotLabel -> "Optical Path Difference (wavelengths) vs Trace Position",
    AspectRatio -> 1, ReportedSurfaces -> 7]}]}],
  SymbolicValues -> {ys -> 10, y -> 1}, SliderLabelReplacements ->
  {"ys" -> "Beam Width", "lam" -> "Wavelength"},
  OutputType -> Notebook]

```

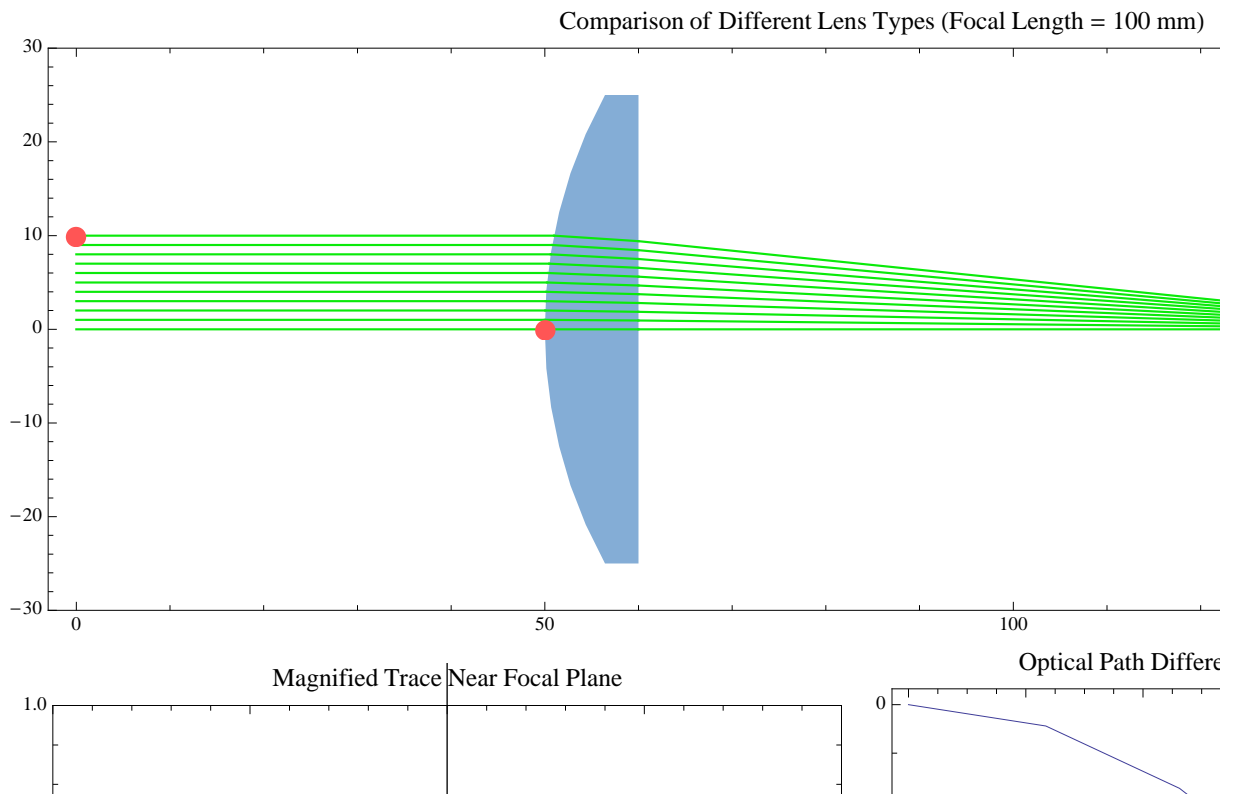


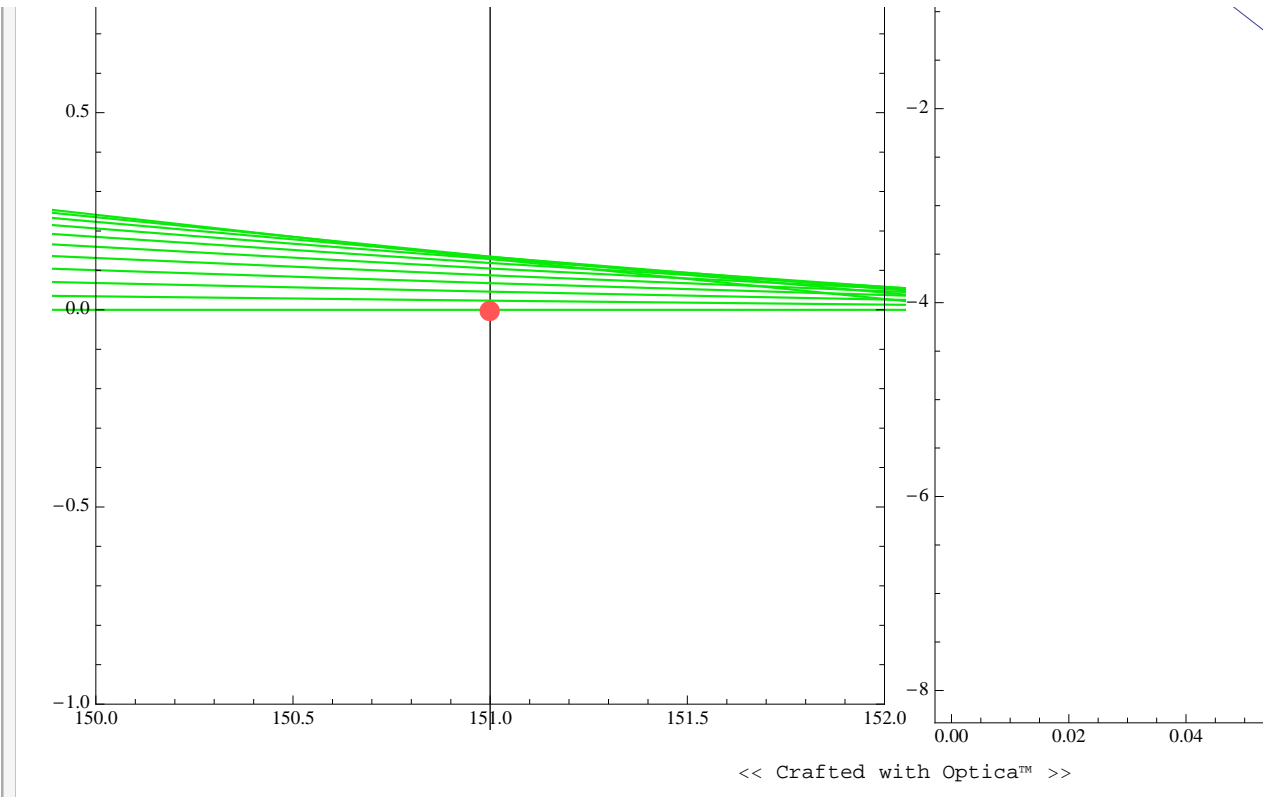


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Lens Type **Plano-Convex (BK7)**

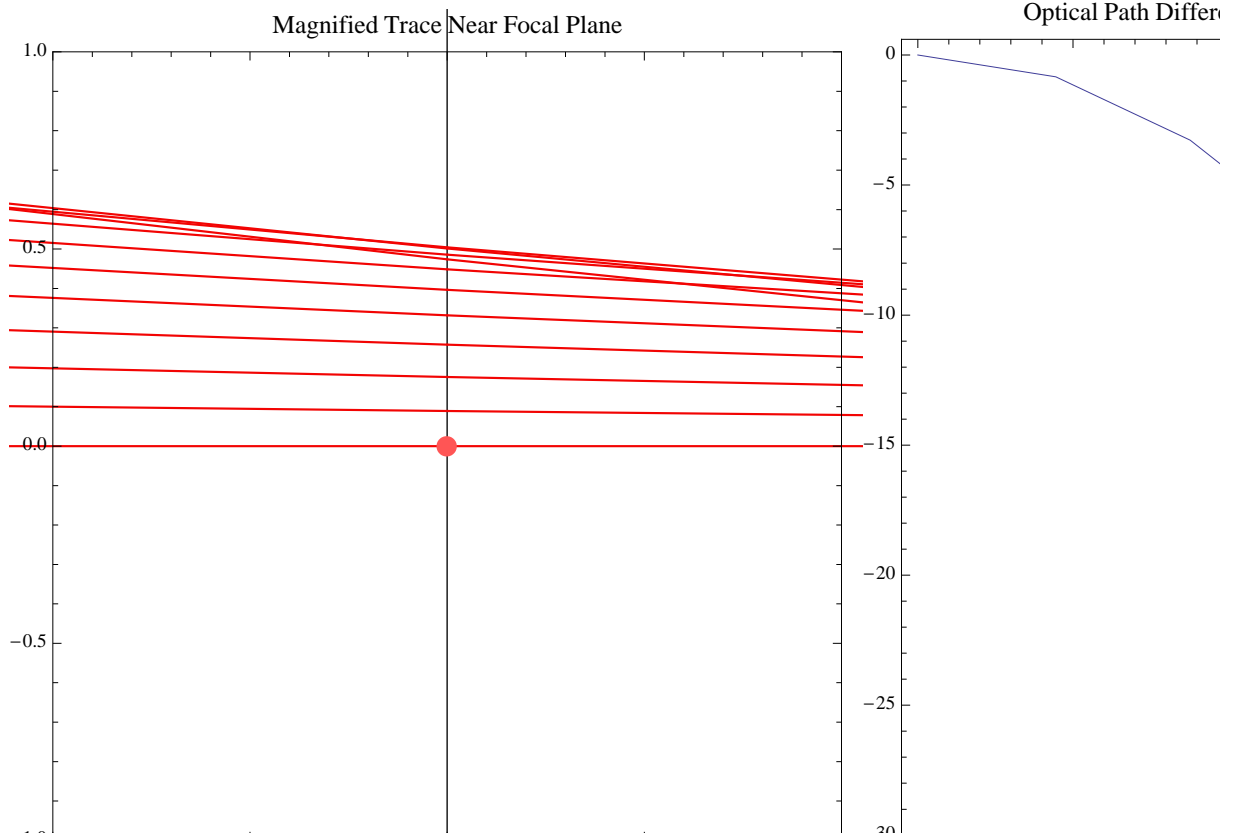
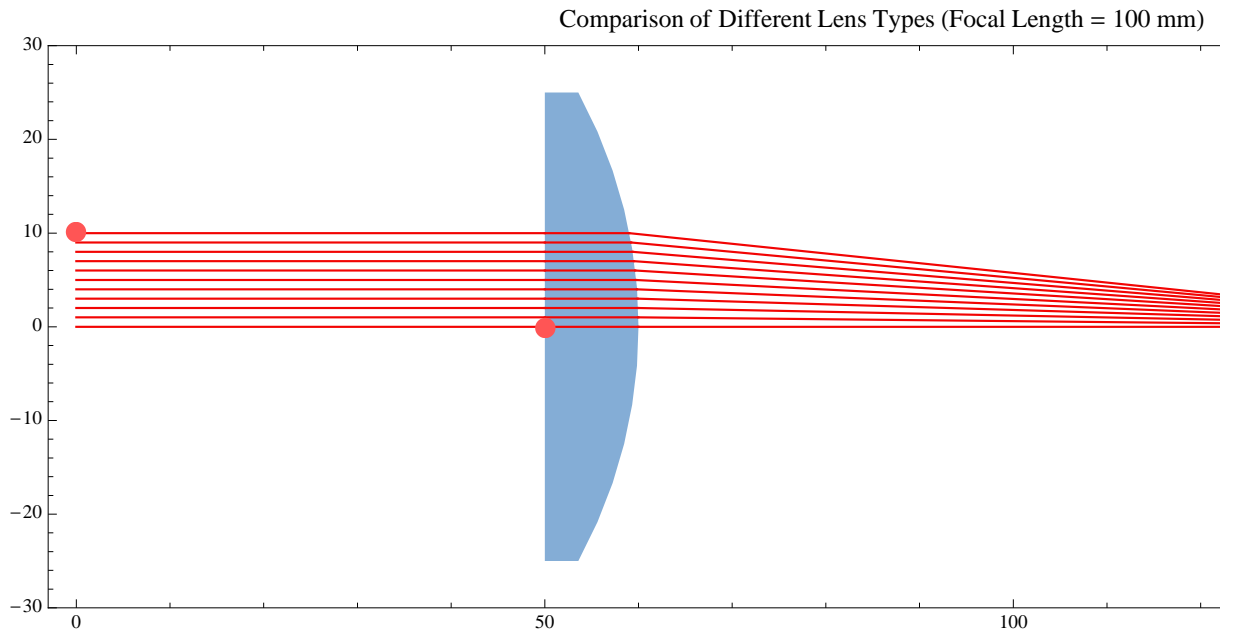
Wavelength  0.532

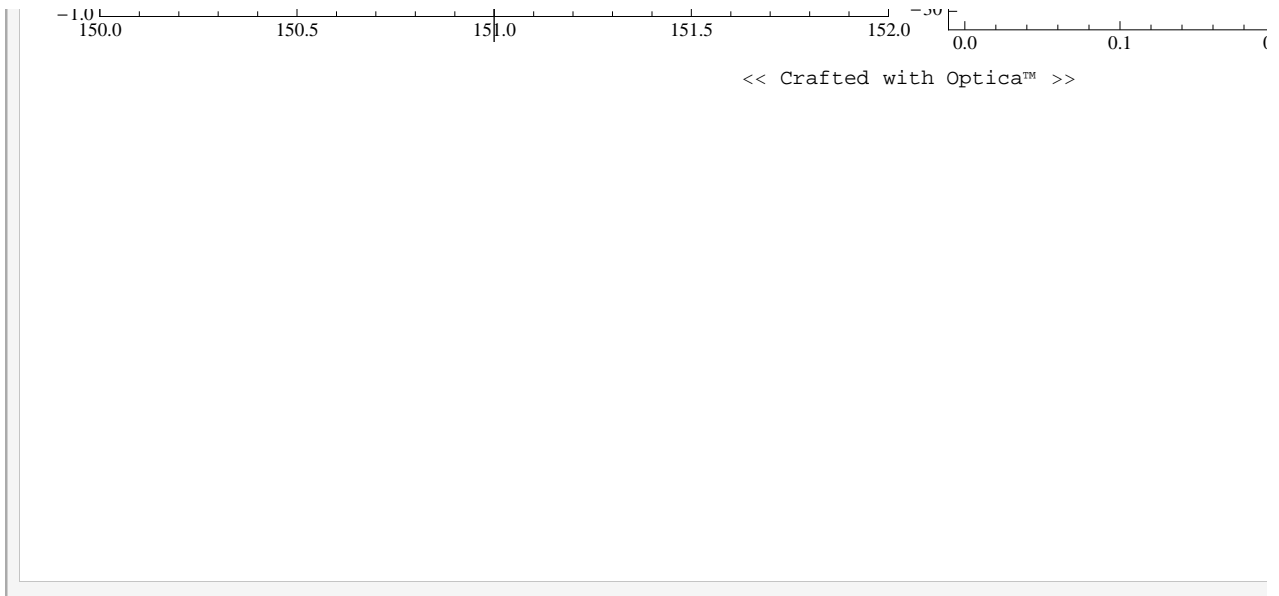




Lens Type

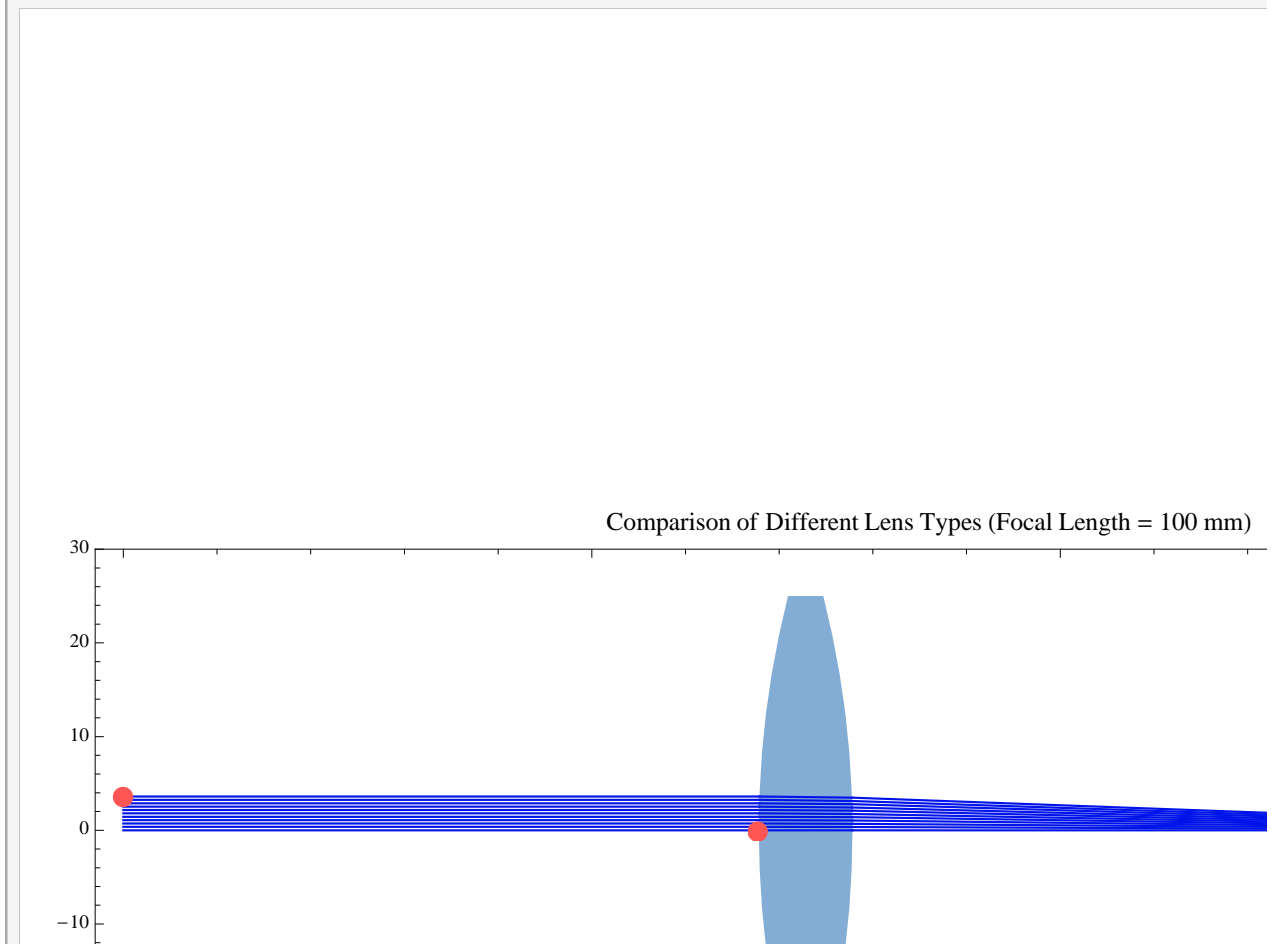
Wavelength  0.6465

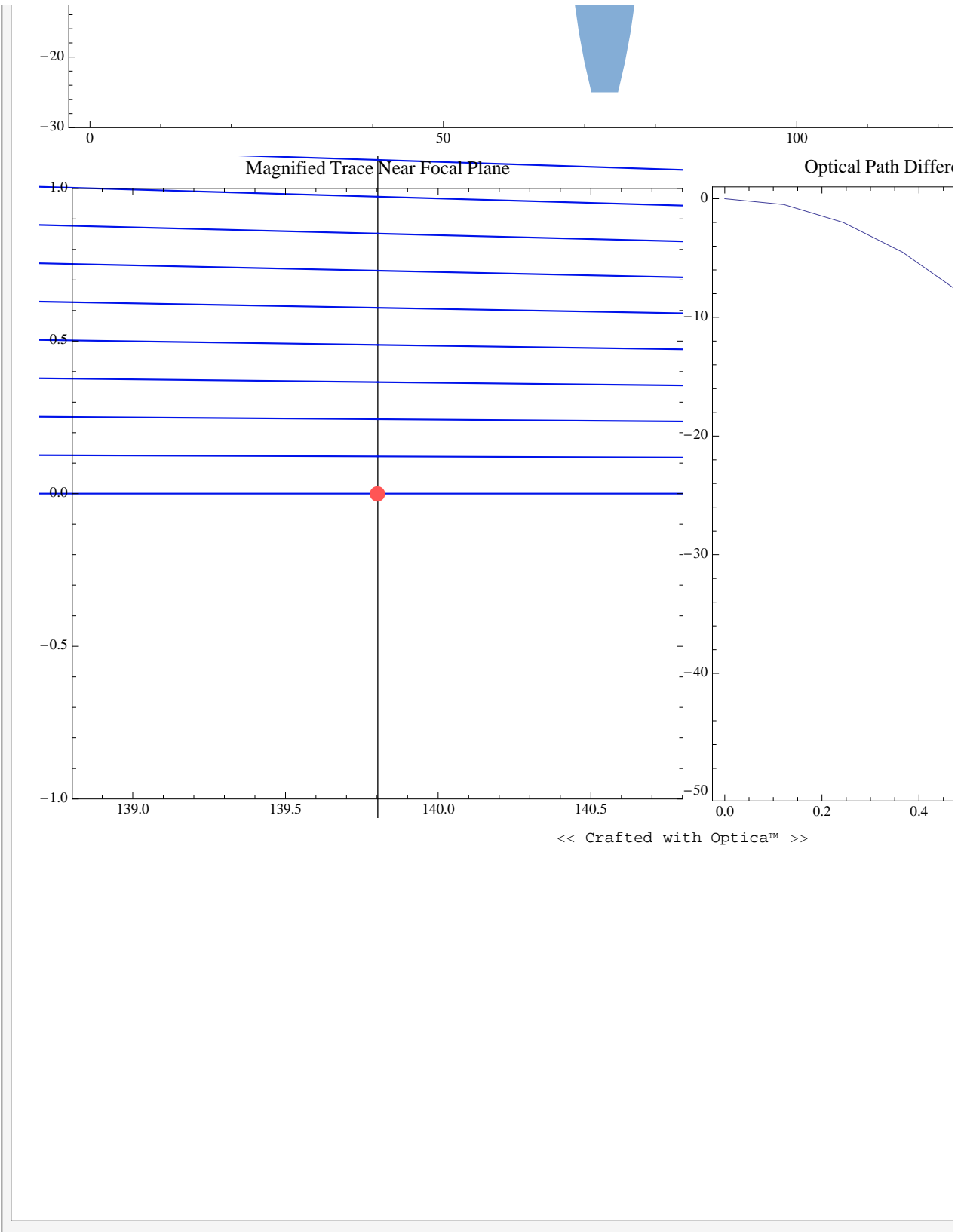




Lens Type **Bi-Convex (BK7)**

Wavelength  0.4445





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